

WE CLAIM:

1. A database interface for interfacing to a database of a plurality of sets of non-text data, each set of non-text data having a descriptive text caption associated therewith, the interface comprising:

receiving means for receiving an input textual query;

comparing means for comparing said input query with said captions for said sets of non-text data to determine the similarities between said input query and said captions and between said captions; and

display control means for controlling display means to display representations of a plurality of sets of non-text data which have captions which are the most similar to said input query, and for controlling said display means to display said representations separated in accordance with the similarities between their respective captions.

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2. A database interface according to claim 1 wherein each said descriptive text caption is text in a natural language, said input means is adapted to receive a natural language query, and said comparing means is adapted to perform a natural language comparison between said input query and said captions.

3. A database interface according to claim 2 wherein said comparing means is adapted to compare the meaning of said input query with the meaning of said caption.

5 4. A database interface according to claim 1, wherein said display control means is adapted to select the representation of the set of non-text data having the most similar said caption to said query as a focal representation, and to control said display means to 10 display said focal representation at a central position and to display the representations of the rest of said plurality of sets of non-text data around said focal representation at distances dependent upon the determined similarities.

15 5. A database interface according to claim 1, wherein said non-text data comprises image data and said display control means is adapted to control said display means to display thumbnail images of said sets of image data as 20 said representations.

6. A database interface according to claim 1, including means for receiving a selection signal following the selection of a representation as a new query, said 25 display control means being responsible to said selection signal to control said display means to display the selected representation at a central position and to

display the representations for the sets of non-text data which have captions most similar to the caption of the selected representation around the selected representation at distances in accordance with the 5 similarities.

7. A database interface according to claim 6 wherein said database includes a set of similarity measures stored for each set of non-text data, and said display 10 control means is adapted to receive said sets of similarity measures from said database for a selected representation.

8. ~~A database interface apparatus for interfacing a user interface to a database of a plurality of sets of non-text data, each set of non-text data having a descriptive text caption associated therewith, the apparatus comprising:~~

means for receiving an input textual query from said 20 user interface;

means for comparing said input textual query with said captions for said sets of non-text data to determine the similarities between said input query and said captions and between said captions; and

25 means for outputting information indentifying a plurality of sets of non-text data having captions most similar to said query to said user interface for the

display of representations of said sets of non-text data separated in accordance with the similarities.

9. A user interface for use with said database
5 interface apparatus of claim 8 and for displaying a plurality of representations of sets of non-text data, the user interface comprising:

input means for inputting a text query;
means for sending said input query to said database
10 interface apparatus;

means for receiving information identifying a plurality of sets of non-text data having the most similar captions to said query, and similarity values;

means for retrieving said sets of non-text data from
15 said database; and

display means for displaying representations of said sets of non-text data separated in accordance with the similarity values.

20 10. A database interface for interfacing to a database of a plurality of sets of non-text data, each set of non-text data having a descriptive text caption associated therewith, the interface comprising:

receiving means for receiving an input textual
25 query;

comparing means for comparing said input query with said captions for said sets of non-text data to determine

the similarities between said input query and said captions;

selecting means for selecting the determined most similar set of non-text data; and

5 display control means for controlling display means to display a representation of the selected set of non-text data and representations of a plurality of sets of non-text data having the most similar captions to the caption of said selected set of non-text data separated
10 in accordance with the similarities between their respective captions.

11. A database interface according to claim 10 wherein said database stores the similarities between the caption
15 for each set of non-text data and the captions of a plurality of the sets of non-text data which are most similar and identities said plurality of sets of non-text data, said display control means being adapted to retrieve said selected set of non-text data and said
20 similarities and identities for said selected set of non-text data, and to retrieve said plurality of sets of non-text data in accordance with said retrieved identities.

25 12. A database interface according to claim 10, wherein each said descriptive text caption is text in a natural language, said input means is adapted to receive a natural language query, and said comparing means is

adapted to perform a natural language comparison between said input query and said captions.

13. A database interface according to claim 12, wherein
5 said comparing means is adapted to compare the meaning of
said input query with the meaning of said caption.

14. A database interface according to claim 10, wherein
10 said display control means is adapted to control said
display means to display said representation of said
selected set of non-text data as a focal representation
at a central position and to display the representations
of said plurality of sets of non-text data around said
focal representation.

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15. A database interface according to claim 10, wherein
said non-text data comprises image data and said display
control means is adapted to control said display means to
display thumbnail images of said sets of image data as
20 said representations.

16. A database interface according to any one of claims
10 to 15 including means for receiving a selection signal
following the selection of a representation as a new
25 query, said display control means being responsive to
said selection signal to control said display means to
display the selected representation at a central position

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and to display the representations for the sets of non-text data which have captions most similar to the caption of the selected representation around the selected representation at distances in accordance with the
5 similarities.

17. A database interface according to claim 16 wherein said database includes a set of similarity measures stored for each set of non-text data, and said display
10 control means is adapted to receive said set of similarity measures from said database for a selected representation.

18. A database interface apparatus for interfacing a user interface to a database of a plurality of sets of non-text data, each set of non-text data having associated therewith, a descriptive text caption and information identifying sets of non-text data having the most similar captions and giving the similarities;

20 the apparatus comprising:

 means for receiving an input textual query from said user interface;

 means for comparing said input query with said captions for said sets of non-text data to determine the
25 similarities therebetween;

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means for outputting information identifying a set of non-text data having a caption most similar to said query to said user interface; and

5 means causing said information for said set of non-text data to be sent from said database to said user interface for the display of representations of the identified sets of non-text data separated in accordance with the similarities.

10 19. A user interface for use with said database interface apparatus of claim 18 and for displaying a plurality of representations of sets of non-text data, the user interface comprising:

15 input means for inputting a text query;
means for sending said input query to said database interface apparatus;

means for receiving information identifying sets of non-text data and comparative similarity values;

20 means for retrieving said sets of non-text data from said database; and

display means for displaying representations of said sets of non-text data separated in accordance with the similarity values.

25 20. A database interface method for interfacing to a database of a plurality of sets of non-text data, each

set of non-text data having a descriptive text caption associated therewith, the method comprising:

receiving an input textual query;

5 comparing said input query with said captions for
said sets of non-text data to determine the similarities
between said input query and said captions, and between
said captions; and

10 control display means to display representations of
a plurality of sets of non-text data which have captions
which are the most similar to said input query separated
in accordance with the similarities between their
respective captions.

15 21. A database interface method according to claim 20,
wherein each said descriptive text caption is text in a
natural language, said query is input as a natural
language query, and the comparing step performs a natural
language comparison between said input query and said
captions.

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22. A database interface method according to claim 21,
wherein said comparing step compares the meaning of said
input query with the meaning of said captions.

25 23. A database interface method according to claim 20,
including selecting the representation of the set of non-
text data having the most similar said caption to said

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query as a focal representation, and controlling said display means to display said focal representation at a central position and to display the representations of the rest of said plurality of sets of non-text data around said focal representation at distances dependent upon the determined similarities.

24. A database interface method according to claim 20, wherein said non-text data comprises image data, and said display means is controlled to display thumbnail images of said sets of image data as said representations.

25. A database interface method according to claim 20, including receiving a selection signal following the selection of a representation as a new query, responding to said selection signal by controlling said display means to display the selected representation at a central position and to display representations of the non-text data which have captions most similar to the caption of the selected representation around the selected representation at distances in accordance with the similarities.

26. A database interface method according to claim 25, wherein said database includes a set of similarity measures stored for each set of non-text data, and said

set of similarity measures is received from said database for a selected representation.

27. A database interface method for interfacing a user
5 interface to a database of a plurality of sets of non-
text data, each set of non-text data having a descriptive
text caption associated therewith, the method comprising:

receiving an input text query from said user
interface;

10 comparing said input text query with said captions
for said sets of non-text data to determine the
similarities between said input query and the said
captions, and between said captions; and

15 outputting information identifying a plurality of
sets of non-text data having captions most similar to
said query to said user interface for the display of
representations of said sets of non-text data separated
in accordance with the similarities.

20 28. A method of operating a user interface for use with
database interface apparatus operating in accordance with
the database interface method of claim 27 and for
displaying a plurality of representations of sets of non-
text data, the method comprising:

25 receiving a text query;

sending said query to said database interface
apparatus;

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receiving information identifying a plurality of sets of non-text data having the most similar captions to said query and similarity values;

5 retrieving said sets of non-text data from said database; and

displaying representations of said sets of non-text data separated in accordance with the similarity values.

29. A database interface method of interfacing to a
10 database of a plurality of sets of non-text data, each set of non-text data having a descriptive text caption associated therewith, the method comprising:

receiving an input text query;

15 comparing said input query with said captions for said sets of non-text data to determine the similarities between said input query and said captions;

selecting the determined most similar set of non-text data; and

20 controlling display means to display a representation of the selected set of non-text data and representations of a plurality of sets of non-text data having the most similar captions to the caption of said selected set of non-text data separated in accordance with the similarities between their respective captions.

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30. A database interface method according to claim 29, wherein said database stores the similarities between the

caption for each set of non-text data and the captions of a plurality of the sets of non-text data which are most similar and identities of said plurality of sets of non-text data, the method including retrieving said selected set of non-text data, and said similarities and said identities for said selected set of non-text data, and retrieving said plurality of sets of non-text data in accordance with said retrieved identities.

10 31. A database interface method according to claim 30 wherein each said descriptive text caption is text in a natural language, said query is received as a natural language query, and the comparing step performs a natural language comparison between said input query and said
15 captions.

32. A database interface method according to claim 31, wherein the comparing step compares the meaning of said input query with the meaning of said captions.

20 33. A database interface method according to claim 29, wherein said display means is controlled to display said representation of said selected set of non-text data as a focal representation at a central position and to
25 display the representations of said plurality of sets of non-text data around said focal representation.

34. A database interface method according to claim 29, wherein said non-text data comprises image data and said display means is controlled to display thumbnail images of said sets of image data as said representations.

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35. A database interface method according to claim 29, including receiving a selection signal following the selection of a representation as a new query, responding to said selection signal to control said display means to display the selected representation at the central position and to display the representations for the normal text data which have captions most similar to the caption of the selected representation around the selected representation at distances in accordance with the similarities.

36. A database interface method according to claim 35, wherein said database includes a set of similarity measures stored for each set of non-text data, the method including receiving said set of similarity measures from said database for a selected representation.

37. A database interface method of interfacing a user interface to a database of a plurality of sets of non-text data, each set of non-text data having associated therewith a descriptive text caption, and information identifying sets of non-text data having the most similar

captions and giving the similarities; the method comprising:

receiving an input text query from said user interface;

5 comparing said input query with said captions for said sets of non-text data to determine the similarities therebetween; and

10 outputting information identifying a set of non-text data having a caption most similar to said query to said user interface; and

15 causing said information for said set of non-text data to be sent from said database to said user interface for the display of representations of the identified sets of non-text data separated in accordance with the similarities.

38. A method of providing a user interface for use with database interface apparatus operating in accordance with the method of claim 37 and for displaying a plurality of representations of sets of non-text data, the method comprising:

receiving a text query;

sending said query to said database interface apparatus;

25 receiving information identifying sets of non-text data and comparative similarity values;

retrieving said sets of non-text data from said database; and

displaying representations of said sets of non-text data separated in accordance with the similarity values.

39. Data accessing apparatus for accessing each set of
5 data having similarity data giving the similarity of the data, other sets of data, and the identity of the other sets of data, the apparatus comprising;

receiving means for receiving a query;

10 comparing means for comparing the query with said sets of data or meta data for said sets of data to determine at least the most similar set of data;

15 display control means for controlling display means to display a representation for the most similar set of data and representations for other similar sets of data arranged in accordance with their similarity;

selection means for allowing a selection of representation; and

20 retrieval means for retrieving said similarity data for the set of data corresponding to selected representation;

wherein said display control means is adapted to control said display means to display the selected representation and representations for the other sets of data identified in said similarity data arranged in 25 accordance with their similarities.

40. Data accessing apparatus according to claim 39
wherein said comparing means is adapted to determine the
most similar set of data; said retrieval means is adapted
to retrieve said similarity data for said most similar
set of data; and said display control means is adapted to
control said display means to display a representation of
said most similar set of data and representations of
other sets of data identified in said similarity data
arranged in accordance with their similarities.

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41. Data accessing apparatus according to claim 39
wherein said comparing means is adapted to determine a
plurality of the most similar sets of data to said query
and their similarity values; and said display control
means is adapted to control said display means to display
representations of said most similar sets of data
arranged in accordance with their similarity values.

42. Data accessing apparatus according to claim 39,
20 wherein said meta data comprises text, said receiving
means is adapted to receive a text query, and said
comparing means is adapted to compare the text query with
text meta data for said sets of data.

25 43. Data accessing apparatus according to claim 39,
wherein said display control means is adapted to control
said display means to display the representation for the

most similar set of data centrally with the rest of the representations there around.

44. A data accessing method of accessing sets of data,
5 each set of data having similarity data giving the similarities of the data to other sets of data and the identity of the other sets of data, the method comprising:

receiving a query;
10 comparing the query with said sets of data or meta data for said sets of data to determine at least the most similar set of data;

controlling display means to display a representation of the most similar set of data and
15 representations for other similar sets of data arranged in accordance with their similarity;

allowing a selection of a representation;
retrieving said similarity data for the set of data corresponding to the selected representation; and

20 controlling said display means to display the selected representation and representations for the other sets of data identified in said similarity data arranged in accordance with their similarities.

25 45. A data accessing method according to claim 44, wherein the comparing step determines the most similar set of data; the retrieval step retrieves said similarity

data for said most similar set of data; and the display means is controlled to display a representation of said most similar set of data and representations of other sets of data identified in said similarity data arranged
5 in accordance with their similarities.

46. A data accessing method according to claim 44 wherein the comparing step determines a plurality of the most similar sets of data into said query and their similarity values; and the display means is controlled to display representations of said most similar sets of data arranged in accordance with their similarity values.
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47. A data accessing method according to claim 44,
15 wherein said meta data comprises text, a text query is received, and the text query is compared with text meta data for said sets of data.

48. A data accessing method according to claim 44,
20 wherein said display means is controlled to display the representation for the most similar set of data centrally with the rest of the representations there around.

49. Data display apparatus for displaying the relationships between sets of data, the apparatus comprising:
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data receiving means for receiving sets of data and similarity values for the similarity between the sets of data; and

display control means for controlling display means
5 to display representations for said sets of data separated in accordance with said similarity values and to display in a first style links between said representations which correspond to sets of data having a strong similarity value, and in a second style links
10 between said representation which correspond to sets of data having a weak similarity value.

50. Data display apparatus according to claim 49 wherein
said display control means is adapted to control said
15 display means to display said representations as images
of said sets of data.

51. Data display apparatus according to claim 49,
wherein said display control means is adapted to control
20 said display means to display a said link in said first
style if the similarity value associated with the link is
above the means of the similarity values by a
predetermined amount and to display a said link in said
second style if the similarity value associated with the
25 link is below the mean of the similarity values by a
predetermined amount.

52. The data display method of displaying the relationship between sets of data, the method comprising:
receiving sets of data and similarity values for the similarity between the sets of data;

5 controlling display means to display representations for said sets of data separated in accordance with said similarity values; and

10 displaying in a first style links between said representations which correspond to sets of data having a strong similarity value and in a second style links between said representations which correspond to sets of data having a weak similarity.

15 53. A data display method according to claim 52 wherein
said display means is controlled to display said representations as images of said sets of data.

20 54. A data display method according to claim 52, wherein
said display means is controlled to display a said link in said first style if the similarity value associated
with the link is above the mean of the similarity values by a predetermined amount and to display a said link in
said second style if the similarity value associated with the link is below the mean of the similarity values by a
25 predetermined amount.

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55. Data display apparatus for displaying the relationships between sets of data, the apparatus comprising:

data receiving means for receiving sets of data and
5 similarity values for the similarity between the sets of data;

arrangement calculation means for calculating the optimum arrangement of representations for said sets of data on display means so that said representations are
10 spaced according to said similarity values;

display control means for controlling said display means to display said representations arranged in accordance with said calculation; and

user selection means allowing a user to select and
15 move a said representation;

wherein said arrangement calculation means is operable to recalculate the optimum arrangement of said representations following the movement of a said representation.

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56. Data display apparatus according to claim 55 wherein said arrangement calculation means is adapted to carry out iterative calculations of the separations of said representations from starting separations to target separations.

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57. Data display apparatus according to claim 56 wherein said display control means is adapted to control said display means to display said representations at time sequential stages of said iterative calculations.

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58. A data display method of displaying the relationships between sets of data, the apparatus comprising:

receiving sets of data and similarity values for the
10 similarity between the sets of data;

calculating the optimum arrangement of representations for said sets of data on display means so that said representations are spaced according to said similarity values;

15 controlling said display means to display said representations arranged in accordance with said calculations;

allowing the user to select and move a said representation; and

20 recalculating the optimum arrangement of said representations following the movement of a said representation.

59. A data display method according to claim 58 wherein
25 the calculation of the optimum arrangement of the representations is carried out as iterative calculations

of the separations of said representations from starting separations to target separations.

60. A data display method according to claim 59 wherein
5 said display means is controlled to display said representations at time sequential stages of said iterative calculations.

61. A data display apparatus for displaying the
10 relationships between sets of data, the apparatus comprising:

data receiving means for receiving sets of data and similarity values for the similarities between the sets of data;

15 arrangement calculation means for iteratively calculating the optimum separations of displayed representations for said sets of data from starting separations to target separations corresponding to said similarity values; and

20 display control means for controlling display means to display said representations arranged in accordance with said iterative calculations at time sequential stages of said iterative calculations.

25 62. A data display method of displaying the relationships between sets of data, the method comprising:

receiving sets of data and similarity values for the similarities between the sets of data;

iteratively calculating the optimum separations of displayed representations for said sets of data from 5 starting separations to target separations corresponding to said similarity values; and

controlling display means to display said representations arranged in accordance with said iterative calculations at time sequential stages of said 10 iterative calculations.

63. A storage medium storing instructions for controlling a processing to carry out the method of any one of claims 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 15 32, 33, 34, 35, 36, 37, 38, 44, 45, 46, 47, 48, 52, 53, 54, 58, 59, 60 and 62.

64. A signal carrying instructions for controlling a processor to carry out the method of any one of claims 20 to 38, 44 to 48, 52,to 54 and 58 to 62.

65. A computer program for implementation by a computer to carry out the method of any one of claims 20 to 38, 44 to 48, 52,to 54 and 58 to 62.

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66. A method comprising the combination of any one of claims 20 to 38, 44 to 48, 52,to 54 and 58 to 62.

67. Apparatus comprising the combination of any one of claims 1 to 19, 39 to 43, 49 to 51, 55 to 57 and 61.

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